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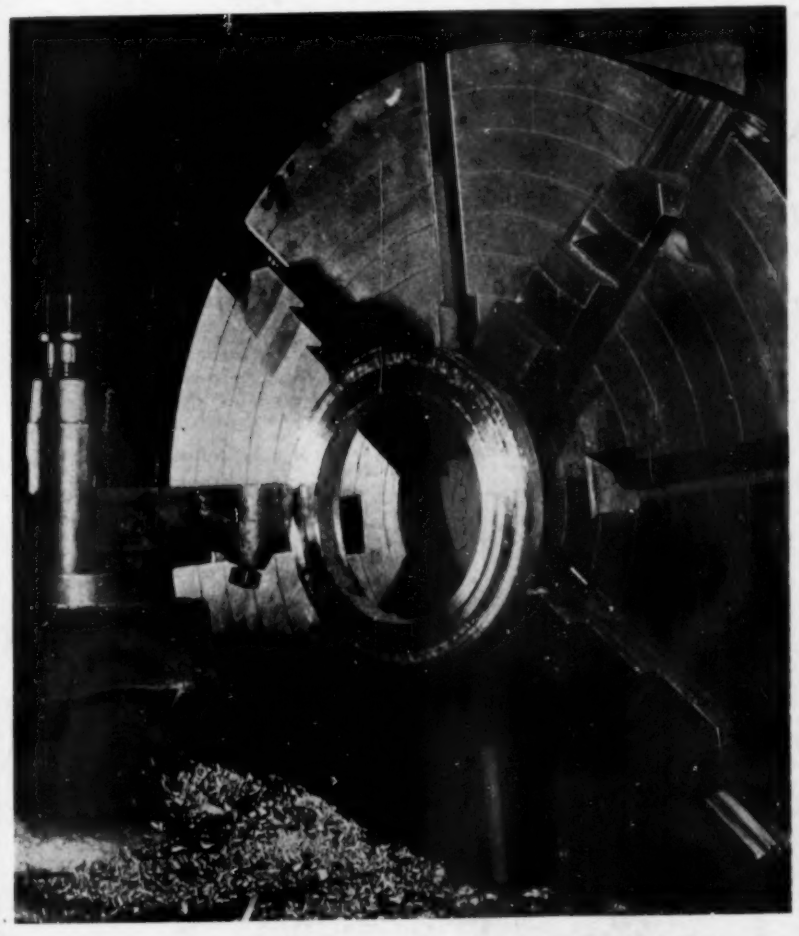
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



NOVEMBER 9, 1935

Industrial Harmony

See Page 296

A SCIENCE SERVICE PUBLICATION

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VOL. XXVIII *No. 761*

The Weekly Summary of Current Science

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Edited by WATSON DAVIS

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DO YOU KNOW?

From two to five million individuals in the United States have organic heart disease.

"Wood-tears" was the Indian name for rubber in its milky form flowing from the *Hevea* tree.

A new upholstery fabric for seats on trucks and buses is reported able to stand hard or "even abusive" wear under all climatic conditions.

Safety goggles worn by workers in industry can be provided with prescription lenses, for those individuals who wear glasses in everyday life.

Calling tuberculosis the "killer of the Indian race," health officials find this disease ten times as prevalent among North American Indians as among white persons.

A New York collector has a rare Chinese relic: a set of Chinese classics written in ink on thousands of tiny slips and used by cribbing students at examination time in Manchu days.

A baby rattlesnake has no rattle.

Nutrition experiments show that mushrooms contain Vitamins B and G.

The possibilities of using cotton in road building may provide a market for two to three million bales a year.

The eye disease trachoma afflicts 80,000 persons in Spain, and is the leading cause of blindness in that country.

Tests show that industrial workers in some instances can do 10 to 35 per cent. more work when bad lighting is changed to good.

The first white man to witness the Indian snake dance is believed to have been Don Antonio de Espejo, Spanish explorer who gave New Mexico its name.

The Roman Emperor Augustus decorated the walls of his villa in Capri with great fossil bones—which he believed were bones of human giants once inhabiting Italy.

WITH THE SCIENCES THIS WEEK

Most articles are based on communications to Science Service or papers before meetings, but, where published sources are used they are referred to in the article.

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What modern use has honey and fish fat? p. 296.

SURGERY

"Fender Fracture" is New Auto-Caused Surgery Problem

Pedestrian, Standing With Leg Straight, Struck From Side by Fender of Car Cutting Corner, New Type Case

A NEW condition for surgeons to treat, called "fender fracture" for short, was introduced to surgeons by Dr. Frederick J. Cotton of Harvard University Medical School at the meeting of the American College of Surgeons.

The new condition is the peculiar kind of break or fracture of the leg which so frequently occurs when a pedestrian, standing with his leg straight, is struck from the side by the fender, mud-guard or tire of an automobile, Dr. Cotton explained. The new kind of fracture may be traced chiefly to the fact that automobiles cut corners and pedestrians stand too close to the curb.

Fender fracture is a real fracture entity, common in these days of auto traffic and bumps, Dr. Cotton said. Fender fracture is the nickname for "comminuted compression fracture of the outer tuberosity of the tibia produced by force exerted from the outer side, producing valgus strain."

Machine age injuries are horribly mutilating because the accidents causing them are protracted, Drs. William R. Cubbins, James J. Callahan and Carlo S. Scuderi of Cook County Hospital, Chicago, told members of the American College of Surgeons.

It is one thing to crack an arm or leg in a simple fall, these surgeons indicated. The injured limb can be put to rest immediately and the broken bone will quickly heal. But when the bone is broken in an automobile accident or by a machine in a shop, the injury is far more severe and healing is much slower because the breaking force continues so much longer, before the automobile or machine can be stopped.

"In an automobile accident, if the thigh of one of the occupants is fractured at the moment of impact, and the car then turns over several times before throwing him clear, the limb is twisted and torn beyond hope of rapid repair," the Chicago surgeons said.

"It is the continuation of the breaking force that causes interposition of tissues between the broken ends of the bone, injures the growth and blood-supply membrane of the bone or periosteum, and injures or destroys the blood supply of the adjacent tissues."

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WHAT IS INSIDE?

Here is a clay envelope sealed 3,900 years ago, now at last to be opened.

ARCHAEOLOGY

Sealed Contract 3,900 Years Old to be Opened at Yale

A CONTRACT written and sealed in an envelope by Babylonian parties 3,900 years ago has arrived in America, and will be opened.

At Yale University, where the impressive document has come to the Babylonian Collection, Prof. Ferris J. Stephens announced that some qualified scholar will open the large, well-preserved clay envelope and remove the clay tablet inside, to study the ancient contract.

The Yale collection has also obtained a piece of Babylonian writing unique in present knowledge of that country. This is the original copy for a personal seal, for the engraver to use, just as today an order might be written to show an engraver how to letter some calling cards. The Babylonian who ordered this seal wrote on a small clay memorandum the words he wanted copied, not in cursive script, but in the careful monumental script used on stone inscriptions.

"Inscriptions on seals presented more than ordinary difficulty to the engraver," explained Prof. Stephens, "for they must be cut in mirror writing in order to produce the proper impression when they are impressed on a soft clay tablet.

"While this copy is written with the signs in their normal positions, there are traces of the practice strokes of the engraver on the edge of the tablet, where he produced a few of the more difficult signs in mirror writing."

The seal as ordered was worded in the style popular about 2000 B.C. It consisted of three names: first the owner of the seal, then his father, then the deity to whom he was especially devoted. Translated by scholars of Babylonian it reads: "Ili-u-Shamash, son of Lublut-ili, servant of Lugal-banda." A letter addressed to this same Ili-u-Shamash is among the tablets Yale has acquired.

Babylonian kings, like unscrupulous kings of Egypt, thought nothing of erasing the name of a predecessor off an inscription in order to claim credit. An unknown king named Kudda, who apparently ruled at the city of Erech about 2450 B.C., has come to light in this way. A broken stone bowl, originally used as a votive offering in a temple, bears an inscription with Kudda's name filled in over an erased one.

Rulers often tried to prevent this royal custom by adding a curse to their writings, calling down awful fate on

any one who dared to erase the writing or add his own name. Whether Kudda defied such a curse cannot be learned, Prof. Stephens said, because the end of the inscription is missing.

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ASTRONOMY

Cloud of Island Universes Added to Known Space

A DENSE cloud of island universes, each of them similar to our own Milky Way, but so far out in space that they can be seen only with the most powerful telescopes, has been located near the southern constellation Horologium by Dr. Harlow Shapley, director of Harvard College Observatory.

Evidence of their existence first appeared in the largest existing catalogue of external galaxies tabulated during the past five years by Mrs. E. M. Lindsay of the Harvard astronomical staff. Almost all of the 7889 galaxies in the Horologium area contained in the catalogue were previously unknown, and quite understandably so, since nearly all of them are fainter than the fifteenth magnitude.

From a survey of the long-exposure photographs taken with the powerful Bruce telescope at Harvard's southern observatory at Bloemfontein, South Africa, from which the catalogue was made, Dr. Shapley has estimated that the metagalactic cloud is populated about twice as densely as space in general. Several denser concentrations or clusters of galaxies within the cloud, he has estimated, are populated as much as three times as thickly as average space.

Celestial Congestion

Just how thickly filled with galaxies this area is can better be understood from the fact that all of the 7889 galaxies recorded in the catalogue are in an area covering less than one per cent. of the total sky. This entire area, according to Dr. Shapley, is "a congested region," one which, by his definition, contains one or more galaxies for every five thousand trillion cubic light years.

The catalogue is part of a general program for the surveying of external galaxies in progress at Harvard, two others having been published during the past five years for other regions of the sky. In all of them celestial bodies are classified according to position, brightness, diameter, form and structure.

Previous to this catalogue for the Horologium area, the largest ever made was the famous "New General Catalogue," published in Ireland 50 years ago, containing tabulations for about 7000 bodies. This earlier catalogue, however, contains almost exclusively objects brighter than the fifteenth magnitude and covers the entire sky, while the Harvard one is limited to a very small area and deals almost entirely with bodies fainter than this magnitude.

Science News Letter, November 9, 1935

GEOLOGY

Famous Great Caverns May Be Younger Than Supposed

MAMMOTH cave, Carlsbad Cavern and other subterranean wonder-places do not need to have their ages estimated in millions of years. Some scores of thousands of years will suffice, in the opinion of Dr. James H. Gardner, oil geologist of Tulsa, Okla.

In a communication to the Geological Society of America, Dr. Gardner advances reasons for believing that most of the great limestone caverns have been formed since the Ice Age, and he offers a new theory to explain their origin.

The age of a cavern can not be accurately estimated on the basis of its stalactitic formations, Dr. Gardner contends. Stalactites, and stalagmites that pile up under their dripping points, are necessarily younger than the caverns in which they form, he points out. They may have started much later.

Stalactites often show in cross-section series of rings like the annual growth-rings of trees. This suggests that they have had alternating cycles of faster and slower formation, depending on the rate of flow and acid content of the water that forms them; but whether these rings represent years, with rainy-season abundance and dry-season scarcity, or whether they represent longer climatic cycles, Dr. Gardner will not venture to state dogmatically.

In any case, however, he declares, it is misleading to estimate age of dripstone formations simply from their bulk; and he feels that the sign in Carlsbad cavern, giving an age of sixty million years based on such a calculation, should be removed.

Dr. Gardner's theory of limestone cavern origin begins with the fact that they are all in thick limestone strata where they slope toward, and not away from, the rivers into which they drain, and the further fact that the lowest point in a cavern is always above the water level in the river. The limestone strata usually continue on the other side of the river, dipping deeper into the earth where they contain static water in porous beds—but never contain caverns below the river level.

According to his explanation the river valley, cutting ever deeper into the earth, has at some time in the past sliced through the sloping limestone strata. This permitted the water with which the stone was saturated to drain into the river, and also allowed a constant circulation of water down from the surface through the stone into the river.

Century after century this has gone on, and always the water flowing through the porous limestone has dissolved some of it and carried it away. Slowly at first, then more rapidly, the porosity of the rock has been changed to cavities, and these have enlarged and run together, forming the cavern.

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PATHOLOGY

Another Sinus Causes Trouble, Surgeons Told

ANOTHER sinus, besides the ones already so well known for the suffering they cause, can contribute its share of aches and pains, Dr. Chester H. Bowers of Los Angeles reminded members of the American College of Surgeons.

This sinus is known as the sphenoid. It is located far back of the nose, approximately in the center of the skull, lying close to the brain and perhaps in intimate relationship with half of the cranial nerves and important blood vessels. It is usually not involved in disease, but it may be the hidden cause of many disagreeable symptoms.

Headache, reflex pain over a canine tooth, pain or continuous burning in the throat, pain in the back of the head or even in the ear are among the symptoms which may be traced to trouble with the sphenoid sinus. Involvement of this sinus may also interfere with vision because the optic nerve is separated from it by a very thin wall.

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SEISMOLOGY

Moon's Tidal Force Provides Trigger Starting Earthquake

Latest Theory of Harvard Geophysicist Receives Confirmation From Quake in Eastern United States

THE EARTHQUAKE that shook eastern United States and Canada early Friday morning, November 1, gave new evidence that the moon and earthquakes are connected.

Dr. Harlan T. Stetson, geophysics research associate at Harvard University, had just completed a study of more than two thousand earthquakes when this new earthquake crashed through with new confirmation of his findings.

In Dr. Stetson's investigation, made for the American Philosophical Society, he found that the largest number of deep focus earthquakes, those occurring more than sixty miles below the earth's surface, occur with greatest frequency when the lunar tidal forces at the quake center are near a maximum.

Calculation of possible influence of the moon upon Friday's shock made by Dr. Stetson at the suggestion of Science Service showed that the tidal force of the moon was at a maximum over New England at the time the quake occurred.

"It is excellent confirmation of the theory of greater earthquake frequency at times of maximum tidal strain in the earth's crust," he declared.

It is not suggested by Dr. Stetson that the moon's gravitational force itself furnishes the energy for an earthquake but that it acts as a sort of trigger to set off the strains in the earth's crust.

The familiar tides of the ocean provide evidence of the effect of the gravitational pull of the moon upon this planet.

The number of quakes occurring near the period of greatest tidal stress is, on the average, two and a half times as great as the number occurring when the tidal forces are at a minimum.

Not until Dr. Stetson studied deep focus earthquakes only did his results clarify. He then found a close correspondence between frequency of such disturbances and the hour angle and declination of the moon.

The moon's hour angle at Boston at the time of the Friday quake was 7 hours 44 minutes and declination was south 24 degrees. This placed the moon 700 miles north of New Zealand and the resulting calculation shows the horizontal component of the lunar tidal force to be a maximum in the region of New England at the time, Dr. Stetson found. The direction of forces was east northeast or approximately parallel to the coast line of the region. This suggests favorable conditions for a slip along a fault line.

The center of the quake was discovered by seismological reports telegraphed to Science Service to be in the region of Lake Nipissing, Ontario.

To scientists the location is best described as north latitude 45.9 degrees, west longitude 79.9 degrees.

To the public it is the area made famous by the Dionne quintuplets who live at Callander.

About a dozen seismograph stations rushed data to Science Service for the U. S. Coast and Geodetic Survey and the Jesuit Seismological Association to use in determining the epicenter. Less than a dozen hours after the quake this cooperation put science's finger on the quake's origin, probably deep in the earth's crust, setting at rest guesses as to location based on single observations.

Earthquakes are not rare in eastern United States and Canada; some 20 quakes occur each year on the average.

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SILVICULTURE

Sandalwood, Valuable Tree Of Hawaii, to Come Back

SANDALWOOD, theme of a thousand romances and poems of early commerce, is being groomed for a comeback in the forests of Hawaii. It once existed there in great quantities, but over-exploitation 125 years ago by an alliance of traders and native potentates almost wiped it out.

The forests were devastated at that time because of the high prices that could be secured in China for this sweet-scented wood. They promise to be re-established because those prices are still maintained.

C. S. Judd, territorial forester, some years ago secured from Mysore, India, seeds of what is held to be the most valuable species of sandalwood. He planted these seeds on a ridge in the suburbs of Honolulu and they grew abundantly. Today there are some 1500 three-year-old trees on this ridge. They are bearing all the seed that is needed for nursery use. Aside from these, an old sandalwood tree is occasionally found in some remote mountain canyon.

SURVIVOR

One of the few remaining native sandalwood trees on American soil. It grows in the mountains of Hawaii where once there were forests of its kind.

Mr. Judd is developing much nursery stock, based on this seed supply, and with the aid of C.C.C. men as a labor source. He is finding, however, that sandalwood trees present certain peculiar problems in their propagation. A seed planted in a pot will sprout and grow normally for six months and then, unless it is given a peculiar variety of aid, it will languish and die. The plant is a semi-parasite. Its roots fasten themselves on the roots of neighboring plants and steal a considerable portion of their nourishment from them. Unless there are proper host plants, they will not survive.

In the pots at the nurseries in Hawaii ironwood seeds are planted with the sandalwood. When the little plants are set out in the open, the ironwood plants go along. Thus they continue to contribute to the support of this valuable but somewhat lazy tree. In its native state the sandalwood always grows among

other trees and helps itself to aid from their roots.

On the ridge that overlooks Honolulu, where 1500 young trees are growing vigorously, they stand among lantana bushes, members of the verbena family.

Sandalwood trees grow rather rapidly. They are of some value at the age of 25 years. It is the heart of the tree, however, that is most precious, and heartwood is not likely to develop greatly until the tree is 40 or 50 years old. Since the present plantings are chiefly in territorial forests, however, the profits do not need to be immediate to make the enterprise sound.

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ENGINEERING

Doctor Says Door Handles on Streamlined Autos are Menace

WHEN medieval warriors drove their chariots into battle, they mounted sharp-pointed knives in the wheel hubs to sideswipe the enemy if they couldn't run him down.

When modern men ride forth for a peaceful Sunday drive, they unknowingly carry similar deadly weapons mounted in the doors of their streamlined motor cars. Dr. Samuel McLanahan of Baltimore, calls attention to this (*Journal, American Medical Association,* Sept. 28.)

The automobile door handle is a "menacing and dangerous projection," the cause of disfiguring injuries and occasional deaths, Dr. McLanahan charges. He describes six striking cases of accident resulting from persons being struck by the door handles of motor cars and mentions six other recent accidents of a similar nature, two of which were fatal puncture wounds of the skull.

Cases Cited

One case described in his report was that of a motorcyclist who collided with an automobile. The car door handle was driven through his skull. The handle of a taxicab tore a deep gash in the chest of a little girl running in the street. A Negro crossing the highway had a long gash torn in his abdomen when struck by a passing car.

A young man of 22 has lost all sensation in his right arm and use of that member since an automobile struck him and the door handle tore a hole in his forearm. While crossing a bridge recently, a boy of 16 was sideswiped and his right hand permanently disfigured by the door handle.

"A casual glance at a row of passing cars cannot but convince one of the potential danger of this projecting piece of metal," Dr. McLanahan declares. "In the recent streamlined models is to be seen many a door handle that is little short of a spear—truly a vicious weapon—directed toward any victim who may chance to be in its path. The possibilities of mutilation are easily imagined."

Cars with handles that are directed toward the rear, because the hinges of the door lie in that direction, are less menacing, the doctor states, although they are still dangerous projections.

Improvements must finally come from automobile engineers, the physician declares. He has approached one large manufacturing company and earnest consideration of the question has been promised.

Dr. McLanahan suggests two requisites for safety. The first is a handle (if there must be a handle) without sharp projections, as instanced in the oval ones on certain obsolete models. The second is a handle that lies either close against or is countersunk within the side of the door.

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SURGERY

High Blood Pressure Relieved by Surgery

NEW HOPE for successful surgical operation in combatting the menacing disease of middle age—high blood pressure—has been reported to the meeting of the American College of Surgeons.

Surgical aid for relieving the ailment which brings to a halt many ambitious careers before the prime of life is over will not work for all types of high blood pressure, said Dr. Alfred W. Adson of the Mayo Clinic, Rochester, Minnesota, who described the new operative technic.

Over a period of five years, he added, however, the form of high blood pressure known as essential hypertension has been treated by operations in thirty-five cases. Tried for these 35 people, the operation was in some cases a successful measure taken only after all routine medical practices were applied and found wanting.

The operative technic, still not wholly perfect, consists of cutting nerves which control the contraction and dilation of blood vessels in whole areas of the body.

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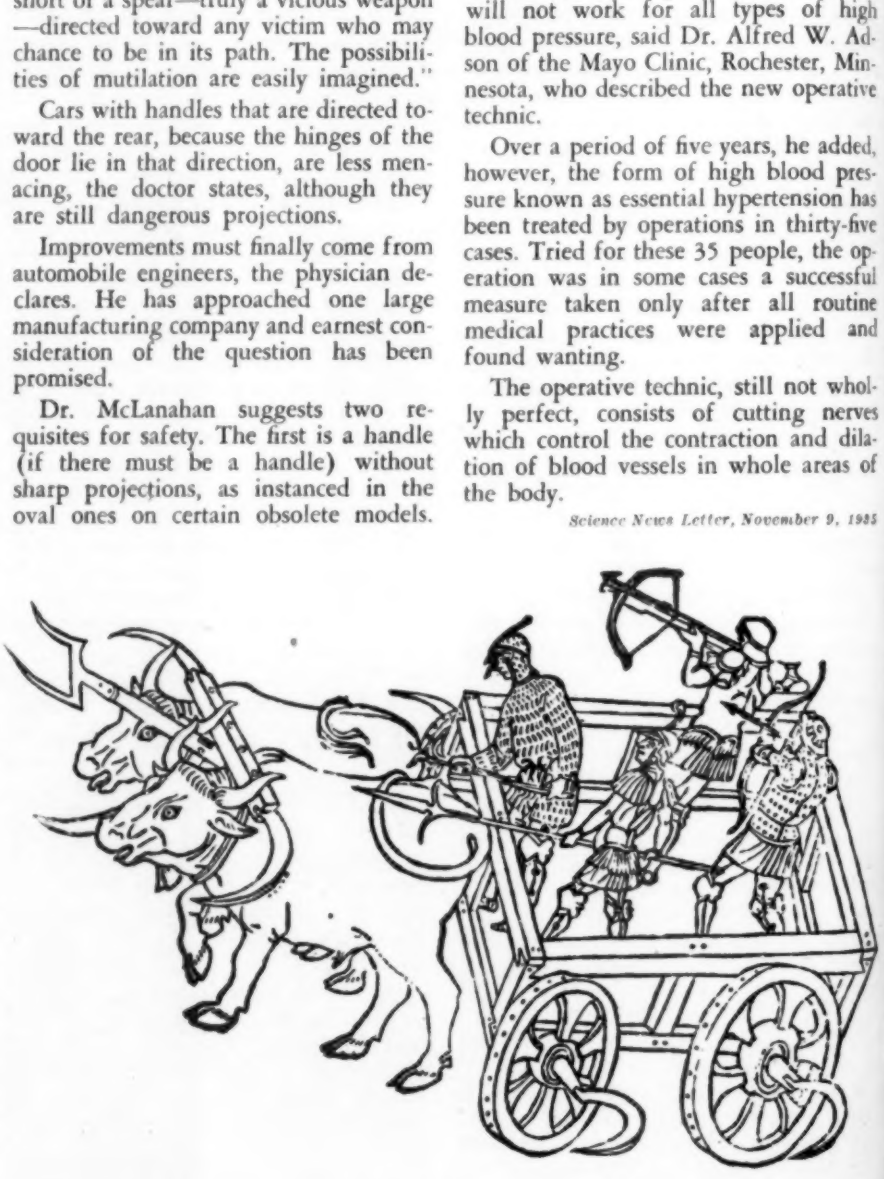

DEADLY

This war chariot of days gone by bears little resemblance to modern motor cars, yet both provide similar hazards to the pedestrian.

GENERAL SCIENCE

Pittsburgh Rises and Falls On Daily Moon Tide in Rocks

National Research Council Tour Learns of Modern Feats in Geophysical Prospecting and Communication

PITTSBURGH is rising and falling from 13 to 23 inches each day, it was disclosed at the research laboratories of the Gulf Refining Company there.

Dr. Paul Foote, director of the laboratories, told members of the National Research Council's industrial tour for banking and business executives that long-time measures of the force of gravity showed the startling effect of land rise and fall due to moon tides in the solid crust of the earth. (See *SNL, Nov.* 2, p. 286 for other reports of the tour.)

Such gravity measurements, Dr. Foote pointed out, are necessary in geophysical oil prospecting and are widely used by field parties to detect oil deposits thousands of feet below the surface. The extremely sensitive gravity apparatus is constantly being checked and tested in the laboratory and from these continuous records Pittsburgh's rise and fall each day is disclosed.

The sensitivity of the equipment is such that forces equal to only one ten-millionth of gravity are detectable. This is about like saying that if a fireman on a 500,000 pound locomotive threw off a small lump of coal the apparatus could detect the weight difference.

Betters Chances

The importance of geophysical prospecting, by which geophysicists discover oil wells without making costly test drills, lies in a reduction of wasteful chances. In the Texas Gulf region, where oil is plentiful, there is but one chance in 1,000 of hitting oil by simply sinking a well. By the geophysical method, chances are now lowered to only one in ten or even less.

Coupled with the sensitive gravity measurements are magnetic and earth-wave reflection tests. The magnetic measurements determine the minute changes in the force of the earth's magnetism due to different layers of rock below the surface. The magnetic materials are in the basic levels, and oil-bearing rocks are found above them.

Tremor measurements are taken also on earthquake wave apparatus, the seismograph. Small charges of dynamite are set off which set up earth tremors. Some come direct to the recording instruments set up along the earth's surface. Others, however, go downward and are reflected back upward off underlying layers and indicate the presence of various types of rock strata which may contain oil.

Linking the three methods together —gravity, magnetic and man-made earthquake measurements — scientists have discovered mountain ranges which lie 5,000 feet below the surface. The Amarillo mountains in Texas are typical of these regions, which lay hidden below the earth's surface until disclosed by geophysical prospecting.

Above the buried mountains lie the oil-bearing sands and salt domes of the great Texas oil field.

Better Telephone

A new type of telephone transmitter for desk type phones, which brings as much improvement in the art as all the previous developments in the last forty years, was announced at the Bell Telephone Laboratories.

Two thousand installations of the high quality, improved type phone are now being put into commercial operation for study in actual service use, Harvey A. Frederick, engineer in charge of the development, stated.

In a test demonstration the industrial and financial executives listened in on a phone conversation between two desk stand instruments. The average amount of line and room noise was then inserted in the circuit and the transmission gradually weakened until it was barely possible to hear what was being said. A further increase in the noise level was then made. With these unfavorable conditions, under which it was found impossible to understand the conversation, the new telephone set was switched in, and the listeners found they could again hear clearly.

Still using the new development set, normal noise conditions were reestablished and the listeners were shown what happens if the range of sound frequencies is varied. Lack of low-pitched sounds makes the talk seem thin and faint, while cutting out high-pitched sounds makes it difficult to understand.

In appearance the new set differs radically from previous types, for all parts of the telephone in a user's home are on the desk or table. The familiar black box mounted on the wall now serves as the base of the set and contains a more compact bell ringer, the induction coil and a quieter dialing device.

The transmitting unit is known as the capsule type. It is a simplified, compact adaptation of the costly radio microphone. No accessory amplifying equipment is needed, however. Its frequency range, Mr. Frederick explained, runs from the bass tones of the human voice, at about 150 cycles, into a treble pitch of about 5,000 cycles.

Over 300,000 installations of this new type of capsule transmitter have already been made in present hand-set type phones with the aid of an adapter. Less than one in a thousand of these have failed in service.

No Sure Thing

Research has nothing of the miraculous or magical about it; it is not certain to pay in any given project. Only its net result pays, and pays big, in the long run, said Dr. C. E. K. Mees, director of the Eastman Research Laboratories. Research, he stressed, is gambling on results, and while the odds are something better than even, it is no sure thing. Many failures may block the path before success is reached. The saving factor is that one single success is often so important and has such unforeseen and wide ramifications that it is profitable to industry.

"The real problem in directing research," said Dr. Mees, "is what research shall you do and when shall you stop doing it. The decision is usually in the hands of some important body.

Who Should Judge

"Now in my opinion the best person to decide is the man who is doing the research, and the next best person is the head of the department, who knows all about the subject and the work.

"After that, you leave the field of the best people and start on increasingly worse groups: the research director who is wrong about half the time, a committee wrong most of the time, or a committee of vice-presidents who are wrong all the time."

Science News Letter, November 9, 1935

Government scientists are investigating the so-called sulphur sponge, a pest that bores into shells of oysters and stunts their growth.

ASTRONOMY

Great Meteor Seen—Half Moon's Diameter

AN EXCEPTIONALLY large and brilliant meteor, so bright that it was clearly visible against the setting sun, was reported to Harvard Observatory by Prof. William R. Ransom, Tufts College mathematician and amateur astronomer.

It was sighted Tuesday, October 22, at 5:10 p. m. in practically broad daylight, almost due west and travelling vertically. It appeared fairly high in the sky, traveled on a path about thirty degrees long, and disappeared about twenty degrees above the horizon. Its head was about half as wide as the full moon. It had a sizeable tail and was brilliant bluish-white in color. Several other similar reports were made to the Harvard astronomers. The meteor was also seen from New York City.

Science News Letter, November 9, 1935

AVIATION

New Instrument Checks Pilot's "Blind Spots"

SAFER airplane landings are expected to result from a new instrument developed by the National Advisory Committee for Aeronautics which makes possible, for the first time, an accurate plotting of the "blind spots" in a pilot's line of vision.

Blind spots are those regions where the body of an airplane, its engine or wings obstruct the view so that the pilot must make his landings, in part, by instinctive "feel" of his plane rather than by actual sight. Blind spots, too, are the menace of military airplanes in wartime, for enemy aviators can sneak up in a blind spot zone and attack almost before the victim plane realizes anyone is near.

The new apparatus which charts blind spots is the invention of Melvin N. Gough of the N. A. C. A.'s staff at Langley Field, Va. Its name is the visiometer.

Place one in the cockpit of a plane at the spot where the pilot's head comes in actual flight and the device measures accurately the exact parts of the plane which obstruct vision. Plotting the data thus obtained on graph paper enables scientists to obtain a plane projection of the three-dimensional field of view. The result is comparable, in its way, to the Mercator projection of the three-dimensional earth on a wall map for the classroom.

Easily portable and adjustable, the new N. A. C. A. visiometer can take its readings in the "flight" position of the pilot or in his "landing" position. During the latter the pilot's seat is elevated and his head comes up from behind the windshield. In this position the field of view is considerably improved.

In military craft the problem is especially important. During the World War many pilots cut away part of the fabric of their planes to eliminate such blind spots and obtained good success (which for them meant longer life), even though the performance of their planes was sometimes reduced.

By using the new visiometer and finding blind spots while the plane is sitting in its hanger, improvements in military craft are also expected. During the war such findings were military secrets and carefully guarded.

Science News Letter, November 9, 1935

SURGERY

Honey, Ancient Dressing For Wounds, Rediscovered

HONEY as a dressing for wounds was popular at one time in the Middle Ages. Still earlier, during the Roman Empire, it enjoyed a certain vogue; and Pliny refers in a certain passage to fish fat and honey as making a good ointment for wounds. It may well be that the fish fat he refers to was codliver oil.

Now honey has been re-discovered as a remarkably effective ointment. In a Red Cross hospital in Hamburg, Germany, tests have been carried out with honey during the past half year, and it has been found that even contaminated wounds quickly become cleaner under its influence. But though it cleans a wound, it does not seem to make it heal more quickly than before. As codliver oil promotes rapid healing, it has been combined with honey in an ointment so as to achieve the double purpose of cleansing and healing.

So in this respect we are back again in the days of Pliny, after many a digression and much circumspection.

How does honey act? Does it cause beneficial fermentation? And which of its many component parts is most potent: its sugar, mineral salts, plant acids, higher alcohols or some ferment? Doubtless the Germans, with their methodical instincts, will isolate each of the component elements of honey, and will try each in turn on a number of cases of varicose ulcers, wounds, etc. Pending conclusive findings from these future experiments, tests with whole honey will be continued.

Science News Letter, November 9, 1935

IN SCIE

ETHNOLOGY

Flathead Indians Gain First Tribe Constitution

INDIAN history has been made. Aged Flathead chiefs in colorful regalia of feathers and buckskin gravely watched Secretary of Interior Harold Ickes sign an important document. While news cameras flashed and clicked, the Government of the United States presented to the Flathead Tribe of Montana the first tribe constitution approved under the Indians' new deal.

The document, prepared mainly by the tribe itself and accepted by popular vote five to one, gives the Flathead Indians the legal machinery for organizing their own group and taking over a large measure of power over their own affairs. All Indian tribes who accept the provisions of the Indian Reorganization Act, passed by the last Congress, may work out their own constitutions, and a number of tribes have been actively engaged in this task.

The historic document was accepted by Martin Charlo, 75-year-old Flathead chief, who replied in his native tongue to Secretary Ickes' words of welcome. As on other historic occasions between Indian chiefs and white men, an interpreter echoed each speech in the alternative tongue.

Once adopted, a tribal corporation cannot be abolished by any Indian Commissioner or Secretary of Interior, it has been pointed out. Only by Act of Congress can such an organization of Indians be abolished.

Science News Letter, November 9, 1935

PHOTOGRAPHY

Mechanics is Portrayed In Photo-Mural by Students

See Front Cover

THE photographer has found beauty in a machine shop in the illustration shown on the front cover of this week's SCIENCE NEWS LETTER.

The photograph is part of a photo-mural made entirely, from negative to final panel, by members of the Experiments' Club of the DeWitt Clinton High School, New York City. This panel represents "Mechanics."

Science News Letter, November 9, 1935

FIELDS

BOTANY

Wicked Ethiopian "Weapon" Comes From America

AMERICAN barbed-wire manufacturers are said to be refusing orders from the belligerent powers in Africa. But something from America, almost as wicked, was at the front long before Romans and Ethiops began taking pot-shots and spear-jabs at each other.

Cactus is figuring in news pictures from the Ethiopian war zone. Machine-gun nests are shown flanked or half-camouflaged by huge plants of flat-jointed prickly pear bristling with spines—menacing alike to Italian uniforms and Ethiopian chammas, not to mention the legs and arms beneath them.

All true species of cactus are of American origin. The prickly plants were unknown in the Old World before the voyages of Columbus. But once cacti were introduced from Mexico and South America they became established all around the Mediterranean shores in amazingly quick time, and from there they spread throughout the dry lowlands of northeast Africa and southeast Asia, until now they seem normal, native parts of the landscape.

Science News Letter, November 9, 1935

MEDICINE

Expectant Mothers Should Be Given Diet in Detail

DETAILS of the diet to be followed by expectant mothers, in order to safeguard their own and their child's health, were presented by Dr. Leighton C. Conn, professor of gynecology and obstetrics at the University of Alberta Medical School, Edmonton, Canada, at the meeting of the American College of Surgeons.

Dr. Conn, in presenting the dietary details, told his colleagues that physicians generally are too apt to take for granted the patient's knowledge of adequate diet. In spite of the fact that the public of the United States and Canada are "diet conscious," many people, especially expectant mothers, do not eat the right things in the right quantities.

It is not enough to tell the expectant mother "to be careful of her diet," Dr. Conn declared. She must be told explicitly what to eat, with due regard for individual idiosyncrasies.

As a basic framework on which to build such a diet, Dr. Conn suggested a daily allowance of one quart of milk supplemented twice a week by cheese; two cups of vegetables, one fresh when possible; one cup of fruit, including citrus fruits or canned tomatoes three days of the week; one cup of whole cooked cereal supplemented two or three days a month by uncooked grain germ; and one medium sized serving of meat, fish, fowl or eggs, with the addition of liver once each week.

After allowing for any food sensitivities of the individual, the remainder of the diet should be made up of bread, potatoes, macaroni, crackers, rice, cakes, sugar, jelly, jam, syrup, cream, butter and salad oils as dictated by the appetite and the necessity of regulating the increase of weight to about fourteen per cent. of normal weight.

Science News Letter, November 9, 1935

ORNITHOLOGY

Radio-Like Waves Guide Homing Pigeons, Is Theory

WHAT mysterious force draws a homing pigeon back to his home base as if he were tied to it with a rubber band?

Recent suggestions that every point of the earth's surface emanates specific radiations such as the waves sent out from a radio station and that birds react to these "home rays" are worth considering, Dr. Ernest E. Mayr of the American Museum of Natural History, New York, told members of the American Ornithologists' Union.

"While this is an attractive theory, and fully as plausible as any yet suggested, so far nobody has proved the existence of these waves nor has the receiving organ been found in the body of the bird," he said.

"Certain aspects of homing, however, lend some strength to the idea. Atmospheric disturbances seem very detrimental to pigeon races, and the racing of pigeons on certain courses, especially over mountain country, is much less successful than on other routes.

"Because pigeons have been shown to have an excellent homing ability in fog when there are no adverse atmospheric conditions, the electrical disturbances in the air, rather than reduced visibility, seem to be the cause of failure of many flights.

Science News Letter, November 9, 1935

EVOLUTION

Darwin Monument Erected On Galapagos Islands

DARWIN, establisher of evolution as a world-accepted scientific doctrine, has been memorialized by the erection of a monument in one of the loneliest places on earth—the Galapagos islands, where 100 years ago this autumn the germinal idea of evolution first occurred to him. A party of scientists, after a sojourn in Ecuador, went to the islands under the leadership of Dr. Wolfgang von Hagen. They took with them three stonemasons, who erected a pedestal of native basalt. On this they set up a bust of the famous English naturalist.

It was in the autumn of 1835 that Darwin, then a "cub" naturalist just out of college, landed on these uninhabited islands in the Pacific, south of Panama and west of Ecuador. He was serving as junior scientific member with an expedition on the British naval vessel "Beagle." He had observed the remarkable similarities underlying differences in animals and plants in the lands already visited, largely in South America. On the Galapagos, where the party stopped during September and October, the weird and unique fauna, with enormous tortoises, swimming lizards and the only penguins living north of the Equator, he had his great inspiration, which after many years he published in his old age, to revolutionize biological science and loose the philosophico-religious conflict that has not yet died down.

Science News Letter, November 9, 1935

ENGINEERING

Four Lane Highways Are Indicted as Death Traps

FOUR-LANE roads are active death traps and at least two states are taking steps to eliminate them.

Accident frequency records on Indiana's four-lane road that skirts Lake Michigan has caused that state to announce that it will build no more such wide roads without a dividing parkway. At the same time, New Jersey is planning to split eight miles of the Brunswick pike in the middle and slide two lanes of the concrete pavement far enough to one side to provide for a separating parkway.

"The cost will be $50,000 per mile for eight miles, and this investment is made purely for safety—no more travel space is added," says a report in the *Engineering News-Record* (Sept. 26.)

Science News Letter, November 9, 1935

GENERAL SCIENCE

Urges Super-Brain Trust

Most Intelligent Youth, Cloistered in Halls of Science Instead of Religion, May Save Man's Future

By JANE STAFFORD

HERE is a new way to save our tottering civilization.

Select the brightest young men in the world at the age of twenty-five. Let them spend the next twenty-five years learning all that science can teach about man. They must live like the monks of old, renouncing the common way of life with all its pleasures. No golf or bridge, no movies, no banquets or parties—they will not even have time to listen to the radio.

By the age of fifty they will have become super-scientists, able to tell the rest of us what to do to prevent wars, financial depressions, unemployment. From these super-scientists we will learn how to save ourselves from the fate of the Greeks and Romans and Mayas and other peoples of the past who built civilizations nearly as great as ours and then were swept into chaos and oblivion.

This plan is put forward by Dr. Alexis Carrel, Nobel Prize winner, member of the staff of the Rockefeller Institute for Medical Research. He is the man who found a way to keep living tissue growing outside the body indefinitely. His famous bit of chicken heart is still alive and growing after 23 years of life in a test tube. It has, in Dr. Carrel's own words, achieved immortality.

Just recently Dr. Carrel and Col. Charles A. Lindbergh announced a method of transplanting whole organs and glands from the living body into a glass chamber where they may live for days, artificially fed on a blood substitute by a mechanical "heart."

Now a Plan

Now Dr. Carrel gives the world a plan for saving itself from destruction.

"For the first time in the history of humanity," Dr. Carrel says in his new book, *The Remaking of Man* (Harper's), "a crumbling civilization is capable of discerning the causes of its decay. For the first time it has at its disposal the gigantic strength of science."

You have probably wondered, yourself, as you read of the remarkable achievements of science, why men who can successfully stitch together a wounded human heart, who can in some cases restore sight to the blind, who can make stunted children grow, should not be able to remedy the present ills of the world.

Dr. Carrel thinks they could, but there are two great stumbling-blocks in their way at present. One is that no one person is capable of mastering, in the comparatively few years ordinarily given to study, all the knowledge needed to solve our economic and social problems. This first stumbling-block would be removed by establishment of the super-brain trust, Dr. Carrel envisions.

The other great stumbling-block is that, enormous as our present scientific knowledge is, it still is not sufficient. We know a tremendous amount about stars and atoms and a fair amount about bones and muscles and vitamins and calories. We can save ourselves from many diseases, we can build strong and beautiful bodies, we can make powerful machines to do our work and transport ourselves about the globe. Yet we cannot adapt ourselves and the mechanical world we have created each to the other so that we may all live safely and happily.

300-Year-Old Mistake

The reason for this, in Dr. Carrel's opinion, is a 300-year-old mistake our ancestors made.

You remember Galileo. He was the 16th century Italian investigator who climbed the Leaning Tower of Pisa and dropped two iron balls, one much heavier than the other, to show the learned men of his day that heavy objects do not fall any more quickly than light ones. Galileo's studies of gravitation, astronomy and mathematics are among his most famous, but Dr. Carrel reminds us of another of Galileo's contributions to scientific thought. It was a wrong interpretation of this particular idea of the great Italian scientist's which, according to Dr. Carrel, is responsible for our present sufferings.

"Galileo, as is well known," writes Dr. Carrel, "distinguished the primary quality of things, dimensions and weight, which are easily measured, from their secondary qualities, form, color, odor, which cannot be measured. The quantitative was separated from the qualitative. The quantitative, expressed in mathematical language, brought science to humanity.

So far, so good. But the followers of Galileo made the mistake of neglecting the qualitative side of things. In their zeal to measure and weigh, Dr. Carrel charges, they reduced the world and man himself to physics, chemistry and mathematics.

That mistake must be corrected before we can hope to save our civilization, in Dr. Carrel's opinion, because there is more to man than merely chemistry and physics.

"In man, the things which are not measurable are more important than those which are measurable," Dr. Carrel declares. "The existence of thought is as fundamental as, for instance, the physicochemical equilibria of blood serum."

Secondary Error

Another, secondary error, which made matters worse, grew out of the ideas of the French philosopher Descartes, Dr. Carrel says. Material things were then definitely isolated from the spiritual, and the manifestations of the mind became inexplicable. The structure of the body and the way the human machine works became much more real than thought, pleasure, sorrow and beauty.

"This error," Dr. Carrel declares, "switched civilization to the road which led science to triumph and man to degradation."

With the spirit and techniques of science, "our most precious possessions," Dr. Carrel would have us return in thought to the days of Galileo and the other Renaissance savants. The super-brain trusters, shut away in some splendidly equipped and endowed institution (Dr. Carrel suggests as a model the Rockefeller Institute where he himself has spent so many secluded years working at medical problems) are to devote themselves to the study of man in all his aspects, both qualitative and quantitative. Most of all they must study the mind, which psychologists have lately been exploring, and the spirit, which scientists generally have treated with disregard if not with actual disbelief.

Science has advanced our knowledge about the body and its requirements for health to the point where we have de-

NEW SYMBOLS

Instead of stained-glass images of saints, the windows of the new cloisters bear symbols of science. Here is an Einstein formula, set in a window of Fine Hall at Princeton, where Einstein now works.

veloped bodies that are bigger, stronger, and more beautiful than our ancestors possessed. Knowledge of disease and nutrition has also enabled us to protect the babies and the weak so that many more of us survive to middle age than ever before.

Dr. Carrel thinks all this physical development has been made at the expense of our mental development. That, he seems to think, is why with all our knowledge and scientific achievements, we cannot settle disputes without fighting and wars, cannot find a satisfactory and permanent way to distribute the food and other natural resources of the world, cannot prevent kidnapings, murders and other crimes—cannot, in the slang phrase, keep our civilization from going to the dogs.

The activities of the mind which Dr. Carrel would have the super-brain trusters investigate are not merely those mental processes that psychologists have begun to investigate with the aid of intelligence tests. Religion, morals, mysticism, esthetics, clairvoyance and telepathy should be investigated, as well as intelligence. We have neglected these things because they are difficult to study, Dr. Carrel charges. Our physically easy modern life has made the cultivation of religion, morals and mysticism seem unnecessary. Perhaps the present breakdown of the system that has made life physically easy will make many agree with Dr. Carrel that more attention should be paid to mental activities.

Clairvoyance and telepathy, even though rare, actually exist, Dr. Carrel maintains. At risk of losing the good opinion of many of his fellow-scientists, he insists that these deserve scientific study because "they are a normal, although rare activity of the human being.

"But metapsychical researches must not be undertaken by amateurs," he cautions, "even when those amateurs are great physicists, great philosophers or great mathematicians. To go beyond one's own field and to dabble in theology or spiritism is dangerous, even for men as illustrious as Isaac Newton, William Crookes or Oliver Lodge."

The persons whom Dr. Carrel considers qualified to investigate this matter of telepathy, clairvoyance and the like are "experimenters trained in clinical medicine, having a profound knowledge of the human being, of his physiology and psychology, of his neuroses, of his aptitude to lie, of his susceptibility to suggestion, of his skill at prestidigitation."

Such persons, he hopes, will use the techniques of physiology and physics to experiment in the fields of clairvoyance and telepathy and find out what they are really all about.

In Better Position

When we have learned about these things which, though they cannot now be measured, actually do exist, according to Dr. Carrel, we shall be in better position to master and solve the problems that are so disastrously unsolvable now.

Besides suggesting the super-brain trust and the correction of a 300-year-old mistake in our way of thinking, Dr. Carrel has other suggestions for improving the world.

He doesn't think, for instance, that the last word has been said yet on what is the best food for humans to eat. It may distress the conscientious housewife to find that all her carefully acquired knowledge of calories and vitamins may have to be thrown out, or, still worse, augmented by new knowledge. But Dr. Carrel insists that we still do not know enough about the effect of the chemical compounds contained in food on our physiological and mental activities. For one thing, he points out, experiments on human beings have not been carried out long enough to give adequate knowledge of the influence of a given diet.

Food for Thought

Creators and rulers should not be fed like manual workers or like contemplative monks, he suggests. Human beings, "vegetating in offices and factories" probably need a certain type of food not suitable for others. The race will not be improved, he says, merely by feeding children and adolescents plenty of milk, cream and vitamins.

"It would be most useful," he continues, "to search for new compounds which, instead of uselessly increasing the size and weight of the skeleton and of the muscles, would bring about nervous strength and mental agility."

When the world gets into a jam, people look eagerly for a great man to lead them out of their difficulties. Unfortunately, leaders cannot be made to order to fit an emergency, but Dr. Carrel envisions a future in which there will be no failure in the supply. Suitable food may be the means of accomplishing this, he suggests.

"Perhaps some day a scientist will discover how to manufacture great men from ordinary children, in the same manner that bees transform a common larva into a queen by the special food which they know how to prepare," he says.

Greater independence and dignity for industrial workers and white collar workers alike is discussed by Dr. Carrel. Among other ingenious ideas he suggests is having work in heavy industries, that must be done by manual labor, shared by all the people, rather than by compelling a certain group to stay at this arduous labor all their lives. All the young men in the country could be used in those factories for short periods, just as they are enrolled for short periods of military service in European countries.

Back to the Home

Feminists will not like the place Dr. Carrel assigns to women in the new scheme of things. It is back to the home, if not the kitchen and nursery, for them, according to his plan. But his suggestion is not exactly like those of dictators trying to find employment for men and to increase their fighting forces. Dr. Carrel discusses women and their place in the world from the standpoint of a scientist who finds that women and men are neither alike nor equal.

Women are more important for the propagation of the race and their part

in the progress of civilization is higher than that of men. They should be contented with this, Dr. Carrel indicates, and should fit themselves for their own important role without trying to imitate men. Not only will the race be better off, but the individual woman herself will be happier.

"In reality, woman differs profoundly from man," he says. "Every one of the cells of her body bears the mark of her sex. The same is true of her organs and above all of her nervous system.

"It is absurd to turn women against maternity," he declares. "The same intellectual and physical training and the same ambitions should not be given to young girls as to boys. Educators should pay very close attention to the organic and mental peculiarities of the male and the female and to their natural functions. Between the two sexes there are irrevocable differences. And it is imperative to take them into account in constructing the civilized world."

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PHYSICS

New Cosmic Phenomenon Reported by Radio Authority

WHAT may be a new cosmic phenomenon involving the sudden disappearance of high-frequency long-distance radio signals for periods of minutes is reported by Dr. J. H. Dellinger, chief of the Radio Section of the National Bureau of Standards (*Science*, Oct. 11).

The still-mysterious phenomenon first appeared on March 30 and has recurred, regularly, at intervals of approximately 54 days. The next occurrence should have been between October 21 and 25. Dr. Dellinger asks in a report to *Science* that any transmission anomalies occurring in a period of a few minutes should be communicated to him.

According to Dr. Dellinger, "The phenomenon has evinced itself as a remarkable vagary of radio transmission occurring recently at regular intervals, separated in time by twice the sun's rotation period. It is a world-wide phenomenon, or more accurately semi-worldwide, as it involves all high-frequency radio transmission over the illuminated half of the globe and not the dark half.

"Depending apparently on some solar emanation lasting only a few minutes, its thorough elucidation appears to call for the study of such cosmic data as solar activity, terrestrial magnetism, atmospheric ionization, aurora, earth currents, cosmic rays, meteors, etc., as well as high-frequency radio reception."

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PSYCHIATRY

Anti-War Document Pioneers In Very Complicated Field

"PSYCHIATRY is still in a pioneer stage when it comes to understanding and controlling the aggressive instincts of man that lead him to wars," Dr. William A. White, superintendent of St. Elizabeth's hospital—government institution for mental diseases—said in commenting on the psychiatrists' anti-war document published in the SCIENCE NEWS LETTER, Oct. 26.

"The problem is worthy of our metal. But it is one that is enormously complicated.

"It is all right to pioneer, as these gentlemen are doing," he said, referring to the 339 psychiatrists of the world who signed the instrument warning of the dangers in the threat of war. "But we have no definite ideas about the final solution of this immense problem. We have to develop not only more knowledge, but probably also new methods of research."

Other American psychiatrists who have sent their names to Science Service as additional signers of the document include:

Dr. Bernard Glueck, New York City: "Add my name in protest against militarism."

Dr. Percy Hickling, Gallinger Hospital, Washington, D. C.: "I heartily agree."

Dr. Lloyd H. Ziegler, Albany Hospital, N. Y.: "A wholesale revival of William James' concept 'The Moral Equivalent of War' is much needed."

Dr. Franklin G. Ebaugh, Director, Colorado Psychopathic Hospital, Denver: "I concur."

Dr. G. Kirby Collier, Rochester, N. Y.: "I am in full accord, and feel that there should be as much publicity as possible given to this statement. The one paragraph, 'We psychiatrists declare that our science is sufficiently advanced for us to distinguish between real, pretended, and unconscious motives, even in statesmen,' should be brought to the attention of all intelligent peoples."

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PSYCHOLOGY

Growth

● "While there are opportune periods for influencing the growth of a behavior-pattern through extrinsic factors, the performance of the effect of repetition or restriction of an activity is dependent not only upon the time the experimental factor is introduced but also upon the duration of its influence. As long as an organism or a behavior-pattern continues growing, so long does it have powers of restoration. Unless the period of deprivation has extended unduly, the restorative powers of the young child are enormous; hence the performances of a child whose activities have been restricted can at a later date, under the proper conditions, be brought to approximate the activities of the child whose opportunities for action have been stimulated."—Myrtle B. McGraw in GROWTH (*D. Appleton-Century Co.*)

Science News Letter, November 9, 1935

Some safety shoes made for workmen have steel toe caps that will stand 1,950 pounds before deflecting a quarter of an inch.

●RADIO

Tuesday, November 12, 4:30 p. m., E.S.T.
HAZARD IN HOUSEHOLD HEATING, by Dr. Wilmer H. Schulze, City of Baltimore Health Department.

Tuesday, November 19, 4:30 p. m., E.S.T.
A NATIONAL HEALTH SURVEY, by Surgeon General Hugh S. Cumming, U.S. Public Health Service.

In the Science Service series of radio addresses given by eminent scientists over the Columbia Broadcasting System.

PHYSICS

3,000 Degree Temperature In Spinning Electric Furnace

New High For Commercial Type Furnace Obtained When Rotation Throws Melting Thoria Against Outer Walls

THREE thousand degrees Centigrade, a new high for temperatures attained by electric heating furnaces of the commercial type, was obtained in a new type rotating furnace reported to the meeting of the Electrochemical Society by Henri George, director of the Electrothermal Laboratory in Paris, France. Prof. Colin Fink, electrochemist of Columbia University, read the report.

M. George's reported high temperature was considered so important to the electrochemists that discussion of the paper lasted more than a half hour.

With the new type rotating furnace it is possible, said the report, to fuse large batches of such oxides as thoria at 3,000 degrees Centigrade, despite the fact that the refractory walls of the furnace ordinarily melt when a temperature of but 1,800 degrees Centigrade is reached.

By rotating the furnace at high speed the thoria powder is thrown up against the outer walls of the furnace and held there by centrifugal force; thus making, in effect, an inner furnace lining of the high-melting point thoria.

Graphite resistors, used for the heating elements in the furnace, are capable of carrying currents up to 500 amperes per square centimeter. They are 3.5 centimeters in diameter.

"The furnaces," reported M. George, "might be compared to a tungsten incandescent lamp, the graphite resistor corresponding to the lamp filament. The furnaces attain the high temperatures in a very short time and carry out metallurgical reactions rapidly and at high efficiency."

The graphite resistor occupies the axis of the furnace, is fixed at one end and makes electrical contact at the other end by a special spring. The furnace shell rotates about the central heating element.

Technical criticism of the paper was comparatively one-sided in the absence of the author, turning mainly on the "life" of the graphite resistor at temperatures of 3,000 degrees centigrade, and also on what means M. George used to determine his claimed 3,000 degrees temperature.

While specific criticism will be delivered and answered by correspondence, disinterested observers saw a partial answer as to the workability of the rotating furnaces in pictures of commercial installations with capacities up to 200 kilograms.

Science News Letter, November 9, 1935

MEDICINE

Head Hurts More Dangerous At Age of Forty and Over

THE DANGEROUS forties hold a peril unsuspected by most persons in those years, it appears from a report of Dr. George W. Swift of Seattle.

The danger Dr. Swift pictured is that following injuries to brain and spinal cord. Persons forty years of age or older are less likely to recover from such injuries than those in the younger age groups, Dr. Swift found from study of mortality figures.

Advances in surgical practice have reduced the mortality following external head injuries from 60 per cent. to 20 per cent. in ten years, Dr. Swift said. He cited cases from King County Hospital, Seattle, showing that the mortality from head injuries was less than 10 per cent. for those under 15 years, about 13 per cent. for those from 16 to 40 years, and more than 24 per cent. for those from 40 to 60 years. The mortality is also high for persons over 60 years but this, Dr. Swift pointed out, is due to the general condition of the body at these ages rather than to the specific injury.

Each year about 125,000 injuries involving the head and spine occur in the United States. The number is increasing year by year because of the increased speed of transportation and mass production in industry.

In treating head injuries of men and women over 40 years, Dr. Swift urged physicians to pay especial attention to regulation of the pressure of the fluid in the brain and spinal cord.

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PHYSIOLOGY

NATURE RAMBLINGS by Frank Thone

Daylight and Breeding Cycles

BIRDS flying southward, mating activities of some animals, blossoming of late fall flowers like gentians and wild asters, are all governed by one master factor—the days have grown shorter. They are all tied up with a common physiological condition, too—change in their respective cycles of reproductive activity.

The physiological importance of changes in length of day has been closely studied by Prof. T. H. Bissonnette, head of the zoology department of Trinity College, Hartford, Conn.

Modern realization of the importance of changing length of day, or "photoperiodism," was reached first through studies on plants, by Drs. W. W. Garner and H. A. Allard of the U. S. Department of Agriculture. They found that some plants could be stimulated to produce flowers and fruit by artificially lengthening the daylight period with electric light, while an artificial shortening of the day had the same effect on others. "Long-day" plants are typical spring flowers, "short-day" plants are fall flowers.

That shortening days stimulate birds to fly southward was first noted by a Canadian scientist, Prof. W. Rowan of the University of Alberta, who also noted changes in their sex glands that occurred at the same time. He became convinced, however, that these sex changes are due to increased exercise rather than direct response to change in daylight.

Prof. Bissonnette, who took up similar studies at about the same time and independently of Prof. Rowan, has become equally convinced that sex changes in many birds, and in some mammals as well, are directly due to the daylight changes. He has conducted his researches

largely on starlings and ferrets, experimenting with the latter animals in England as well as in this country.

Not merely the length of exposure to light, but other factors as well, have to do with bird migration and other sex-controlled changes in bird and mammal behavior, Prof. Bissonnette concludes, on the basis of his own and other scientists' researches. The intensity of light is one factor: changes occurred more rapidly under bright electric light than under dim illumination of equal duration. Color is another factor: red stimulates sex-gland development, green retards it, at least in starlings. With ferrets, all visible light is about equally effective. Food is a third: starlings kept on a strict lenten diet of bran mash developed no interest in mating, though light conditions were made favorable.

Experiments both in England and in America indicate that the light factor becomes effective through the hypophysis, a sex-controlling gland situated just under the brain. The hypophysis is stimulated by light falling on the animal's eye. Blind animals, and animals kept with hooded eyes, are not affected by day-length changes, while "control" specimens with normal vision go through the changes in sex activity in regular predictable fashion, in relation to seasonal variations of lighting.

Science News Letter, November 9, 1935

PUBLIC HEALTH

Nation-Wide Grading Of Milk Urged to Prevent Epidemics

A NATION-WIDE uniform system of grading all milk produced in the country so that consumers would know the quality of the milk they were using, whether at home or traveling, was urged by Leslie C. Frank, sanitary engineer of the U. S. Public Health Service, at the American Public Health Association meeting.

Such a system would be of advantage to both consumer and producer, Mr. Frank pointed out.

There are in this country each year at least 30 to 50 outbreaks of disease resulting from infected milk, Mr. Frank said. Most people who use milk know that not all milk supplies are safe, but they have no way of distinguishing a safe from an unsafe supply.

Milk producers would benefit also from the plan Mr. Frank presented. The problem of the producers is one of overproduction, or of production of more milk in certain areas than can be profitably sold. Price-fixing efforts have failed and curtailing production would be unwise, in Mr. Frank's opinion.

From the public health viewpoint, not enough milk is being used in the country as it is.

"The only logical solution of both problems is that consumers and industry members coordinate their efforts in a unified nation-wide program to increase milk consumption to the optimum," Mr. Frank declared. "This can be done best by increasing the desirability and safety of milk.

"The voluntary local adoption and strict enforcement of the uniform Public Health Service Milk Ordinance, with the rating of all communities periodically by the State authorities, and with occasional check ratings by the Public Health Service, is offered as the form which the coordinated effort should take. Thus America will not only have safeguarded its most important foodstuff, but will also have promoted the economic welfare of the industry which produces and distributes it."

Science News Letter, November 9, 1935

OCEANOGRAPHY

From the Top Down

● "So far as climbing is concerned, the mountains on the ocean are just the opposite of those on land. Our mountain climbers on the land start out at the foot of the mountain . . . But when a man wishes to explore an ocean mountain he starts at the summit and tries to walk down its sides; for the summit is usually an island like Bermuda."—W. Maxwell Reed in THE SEA FOR SAM by W. Maxwell Reed and Wilfred S. Bronson (*Harcourt, Brace & Co.*).

Science News Letter, November 9, 1935

Honey bees are about fifty times as valuable for their work of cross-pollenation in orchards and fields as they are for the honey they make.

Making a bonfire of autumn leaves is often short-sighted, warns a Cornell agriculturist, for decayed leaves form humus and humus helps soils to hold more of the water they need.

MARINE BIOLOGY

Starfish Are Dyed Blue To Trace Wanderings

BLUE starfish are staring startled oystermen in the face, along the Long Island Sound oyster beds. The orthodox color for starfish in those waters is pink.

The oystermen, however, are being told what it is all about. (*Fisheries Service Bulletin,* Sept. 3). The starfish have been dyed blue for the same reason that migrating birds have aluminum bands fastened about their legs by scientists: to tell where they came from, and how far they have traveled.

Starfish, as is well known, are among the worst enemies oysters have. They fold themselves over the oysters' shells, smother them until they open up, and then devour them. Starfish devastate oyster beds by the square mile in this way.

During the recent session of Congress, funds for the scientific investigation of starfish and other enemies of oysters were appropriated, and research begun at several points. One of the things Victor Loosanoff, Bureau biologist, wanted to learn was the rate of starfish travel—for starfish can move, despite their not-very-motile appearance.

Hard to Tag

But it proved impossible to fasten the customary types of tags or bands on them. They could wriggle out of any kind of knot, and if a tag were stapled right through an arm the starfish calmly shed the arm and grew another. Starfish can do that kind of thing pretty easily.

But a starfish cannot get outside its own hide so easily, so the scheme was finally hit upon of dyeing them a conspicuous color and then turning them loose in thousands. Nile blue, a powerful anilin dye, proved well adapted for the purpose. One ounce of the dry powder provides enough solution to stain more than 25,000 starfish blue.

The process is very simple. The captured stars are dumped into the dye-vat for about a minute, held on deck for an hour, and pushed back into the sea. It costs far less, in both money and time, than any other method of "tagging" living specimens.

Oystermen and all other persons finding blue starfish are requested to write to the U. S. Bureau of Fisheries Laboratory at Milford, Conn., stating the exact location, depth of water and time of capture.

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•First Glances at New Books

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Arctic Exploration

THE VOYAGE OF THE CHELYUSKIN—By members of the expedition, translated by Alec Brown—*Macmillan,* 325 p., $3.50. In 1933, the world followed with interest the attempt of the ordinary Russian cargo boat Chelyuskin to navigate the Northeast Passage. The scientific investigations during the voyage and the adventures, climaxed by the loss of the ship, shipwreck of passengers on the ice, and the rescue, are told by various members of the expedition.

Science News Letter, November 9, 1935

Electricity

A FIRST ELECTRICAL BOOK FOR BOYS—Alfred Morgan—*Scribner's,* 209 p., $2.50. This book might well be on the Christmas present list for boys at the age when they begin to ask embarrassing questions about how the radio, doorbell and telephone work. One might worry over such statements as "There is almost no practical use for static electricity except to teach young scientists and future engineers many facts which are useful to know," but after all the book is for boys and not college freshmen.

Science News Letter, November 9, 1935

Science—Religion

SCIENCE AND RELIGION—N. Bishop Harman—*Macmillan,* 175 p., $1.50. A physician looks at both science and religion, finds some points open to criticism in both, but is able in the end to reach a rational reconciliation between them.

Science News Letter, November 9, 1935

Astronomy

HANDBOOK OF THE HEAVENS—Ed. by Hubert J. Bernhard, Dorothy A. Bennett, and Hugh S. Rice — *Whittlesey,* 131 p., $1. A compact, well-written, well-illustrated book that covers an astonishing amount of territory considering its small size. It will be valuable alike as a text for elementary courses in astronomy and for family or science-club use.

Science News Letter, November 9, 1935

Engineering

ELEMENTS OF STRENGTH OF MATERIALS—Stephen Timoshenko and Gleason H. MacCullough—*D. Van Nostrand Co.,* 350 p., $3.25. This book is an abridgment of Prof. Timoshenko's well-known two-volume advanced treatise on the same subject, and is intended as a textbook for students of mechanical engineering. The reader is constantly referred back to the fundamentals of the subject rather than allowed to make blind substitutions in the equations. For emphasis, the basic equations are given in bold face type. Slide rule answers to three significance figures are given for about half the problems.

Science News Letter, November 9, 1935

General Science

READINGS IN SCIENTIFIC AND TECHNICAL GERMAN—Paul H. Curts—*Holt,* 403 p., $1.75. This book introduces a new element into the teaching of special courses in scientific German. Instead of selecting miscellaneous subjects, arranged at random, a careful continuity is preserved throughout, beginning with *"Der Bau des Weltalls,"* and concluding with *"Technik und Staat."* The student thus gets a good general-survey course while he is absorbing a German scientific vocabulary.

Science News Letter, November 9, 1935

Psychology

THE RELATION OF PHYSICAL GROWTH TO DEVELOPMENTAL AGE IN BOYS—Thomas F. Carey—*Catholic Univ. of America,* 119 p., $1. The author discusses previous studies of the subject and gives description and results of his own study of 259 boys. Of interest chiefly to psychologists and anthropologists.

Science News Letter, November 9, 1935

English

25,000 WORDS SPELLED, DIVIDED, AND ACCENTED—Louis A. Leslie and Charles E. Funk—*Funk & Wagnalls Co.,* 249 p., $1. Not a dictionary, for no definitions are given; but a very compact little book to keep handy on the desk for checking spelling and division of words.

Science News Letter, November 9, 1935

Chemistry

CHEMICAL KINETICS AND CHAIN REACTIONS—N. Semenoff—*Oxford,* 480 p., $10.50. An almost encyclopedic volume by the Russian authority, for specialists in this specific chemical field. Chain reactions include those types where the original release of energy is not directly transformed into heat but first creates intermediate products having considerable energy. These products react with the original compound and are renewed over and over by the released energy.

Science News Letter, November 9, 1935

Radio

PRACTICAL RADIO COMMUNICATION: PRINCIPLES—SYSTEMS—EQUIPMENT—OPERATION—Arthur R. Nilson and J. L. Hornung—*McGraw-Hill,* 754 p., $5. This reference book designed to cover the theory and practice of modern radio communication. It provides the knowledge necessary for all classes of radio operators' license examinations. Radio communication has now become somewhat standardized after its first hectic rush during the last decade. The authors use the current breathing spell to sum up what's gone before. So much material is available that wherever possible clear diagrams are used without a word-for-word description. The system works in making for a more compact book without sacrificing readability.

Science News Letter, November 9, 1935

Embryology

INTRODUCTION TO VERTEBRATE EMBRYOLOGY—Waldo Shumway — *Wiley,* 390 p., $4. Although presented as a revised book, it is to all intents practically a new one. At least two-thirds of the text has been rewritten, and over half the illustrations are entirely new.

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•First Glances at New Books

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Travel

JUNGLE WOMAN — Frances Yeager and Eli Colter—*Appleton-Century,* 312 p., $3. Some years ago, Mrs. Yeager followed her husband to his business post in the Sumatra jungle, and thus became the first white woman to see the amazing conditions there, beyond civilization. Now, years afterward, she vividly describes scenes showing appalling cruelty and greed of white men among helpless natives, and the terror of what baboons and tigers can do to mere humans. Loveliness of dark green jungle and lighter moments of life are in this book, but in the main the book serves to show how terrible life can be.

Science News Letter, November 9, 1935

Bacteriology

A TEXTBOOK OF BACTERIOLOGY—Thurman B. Rice—*W. B. Saunders Co.,* 551 p., $5. Short and to the point is this new textbook of bacteriology. These qualities should, as the author hopes, make it very useful for beginning students. Essential facts are given clearly, while details of elaborate laboratory technic, theories and controversies are left to the longer texts more suitable for advanced students and specialists.

Science News Letter, November 9, 1935

Criminology

SCIENCE VERSUS CRIME—Henry M. Robinson—*Bobbs-Merrill Co.,* 303 p., $2.50. In a series of vivid chapters, the author tell how scientific devices and expert knowledge make small clues—even grains of dust or a strand of hair—yield important criminal evidence. Opening and closing the discussion, he points out weaknesses of American police departments in the battle with crime, and analyzes the reasons for the discouraging fact that of all modern countries "we breed the greatest number of criminals and convict the fewest."

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Health

PERSONAL AND COMMUNITY HEALTH—Clair E. Turner—*C. V. Mosby Co.,* 680 p., $3. The fourth edition of a valuable text for persons of college level intelligence and education, whether in or out of college.

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Meteorology

RAINFALL INTENSITY-FREQUENCY DATA—David L. Yarnell—*Govt. Print. Office.,* 68 p., 10c. A dozen years of hard statistical boiling-down are condensed in the few pages of this bulletin. Designed primarily for the use of engineers, particularly highway engineers, to give them an idea of run-off crises that may be expected in various parts of the United States, it will also be of far wider use, to ecologists, soil conservationists, agronomists and all others whose works have to stand out in the rain. The data are presented both as condensed tables and curves, and graphically in maps.

Science News Letter, November 9, 1935

English

GET IT RIGHT!—John B. Opdycke—*Funk & Wagnalls Co.,* 673 p., $3.50. Answers the multitudinous questions which arise in an office, in connection with spoken, written or printed English. It is more than a secretary's handbook, for it covers in addition such things as simple library arrangement, preparation of news and advertising copy, and proofreading.

Science News Letter, November 9, 1935

Medicine

THE WOMAN ASKS THE DOCTOR—Emil Novak—*Williams & Wilkins Co.,* 189 p., $1.50. Written with sympathy and understanding by an authority on diseases of women, this book answers simply and clearly the many questions about themselves which women ask their doctors or their women friends.

Science News Letter, November 9, 1935

Botany

A FLOWER BOOK FOR THE POCKET—Macgregor Skene — *Oxford Univ. Press,* 380 p., $3. A popular field handbook of British flowers; a very desirable thing for any botanically minded person to take along on a trip abroad if he expects to get outside cities in Britain as every traveller should.

Science News Letter, November 9, 1935

Medicine

MANUAL OF FIRST-AID INSTRUCTION—U. S. Dept. of the Interior, Bureau of Mines — *Government Printing Office,* 221 p., 20c.

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Medicine

MODERN HOME MEDICAL ADVISER—Morris Fishbein, Editor — *Doubleday, Doran,* 905 p., $9.50. Here is the modern counterpart of the family medicine book. Besides giving information on all the common and many uncommon diseases, the volume has sections on first aid, the family medicine chest, diet, posture, sex hygiene and industrial hygiene. Of course the book is not intended to replace the services of a physician, and the first chapter is devoted to the subject of how to choose a doctor. A number of eminent scientists have collaborated with Dr. Fishbein in writing the book.

Science News Letter, November 9, 1935

Physics

LA SPECTROSCOPIE APPLIQUÉE—P. Swings—*Hermann Et Cie, Paris,* 188 p., 15 fr. The applications of spectroscopy in qualitative and quantitative analysis. Brief mention—some six pages—is made of biological applications including the detection of slight traces of metals in the human organism, and a few aspects of medical law as related to spectroscopy.

Science News Letter, November 9, 1935

Aeronautics

THE JUNIOR AIRCRAFT YEAR BOOK, VOLUME TWO—*Aeronautical Chamber of Commerce of America, Inc.,* 225 p., $1.50; to libraries, $1. Readable summary of aviation for 1934, including private, commercial and military achievements. Nearly half the book is devoted to engineering and manufacturing developments during the year and includes outline diagrams of the some 76 different types of airplanes now built in the United States.

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Medicine

SOCIALIZATION OF MEDICINE—Julia E. Johnsen—*H. W. Wilson Co.,* 335 p., 90c. One of the Reference Shelf Series. The book should be helpful to debaters or others intending to speak on the subject as well as to the general reader wishing a compact volume of information on the much discussed subject of state medicine. Both sides of the question are presented.

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